The Montreal Northern Colonization Railway COMPANY.

REPORT

OF

Exploration from Deep River

TO THE

GEORGIAN BAY

BY CHARLES LEGGE, Esq., C. E.,

CHIEF ENGINEER OF THE

Montreal Northern Colonization Railway Company.

MONTREAL:

GAZETTE PRINTING HOUSE, NEARLY OPPOSITE THE POST OFFICE.

1874

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EXPLORATION FROM DEEP RIVER TO THE GEORGIAN BAY

BY CHARLES LEGGE, Esq., C. E.

OFFICE OF CHIEF ENGINEER,
Montreal, 31st March, 1874

To E. LEF. DE BELLEFEUILLE, ESQ.,
Secretary-Treasurer, M. N. C. R.,

SIR,—

I have the honor to acknowledge the receipt of your letter of the 18th ult., containing a copy of the resolution passed by the Board of Directors at a meeting held on the previous day, to the following effect:—

"That the Chief Engineer be requested to make a general exploration "from Deep River to the mouth of French River on Georgian Bay, as soon "as possible, in the course of this winter."

Immediately on the receipt of the above Resolution steps were taken to give effect to its requirements, owing to the lateness of the season and the anticipated early breaking up of the ice on the rivers and streams to be passed, which would add materially to the difficulty of crossing the intervening country.

Having now performed the required exploration, the following report is respectfully submitted, for the information and consideration of the President and Directors.

From an early date in the history of the Montreal Northern Colonization Railway, the policy of the Company has been not only to effect a connection with the Pacific Railway at Lake Nipissing, but also with the navigable waters of the great Lakes, for the purpose of tapping the vast traffic of the North-Western States, and conducting it by the quickest and most direct route, over your railway, to tide water at Montreal and Quebec.

In pursuance of this policy, authority has been obtained from the Legislatures of the Dominion, and of the Province of Quebec, to extend the line from Aylmer where it originally terminated, as far westerly as found practicable through the latter Province, and thence over the Province


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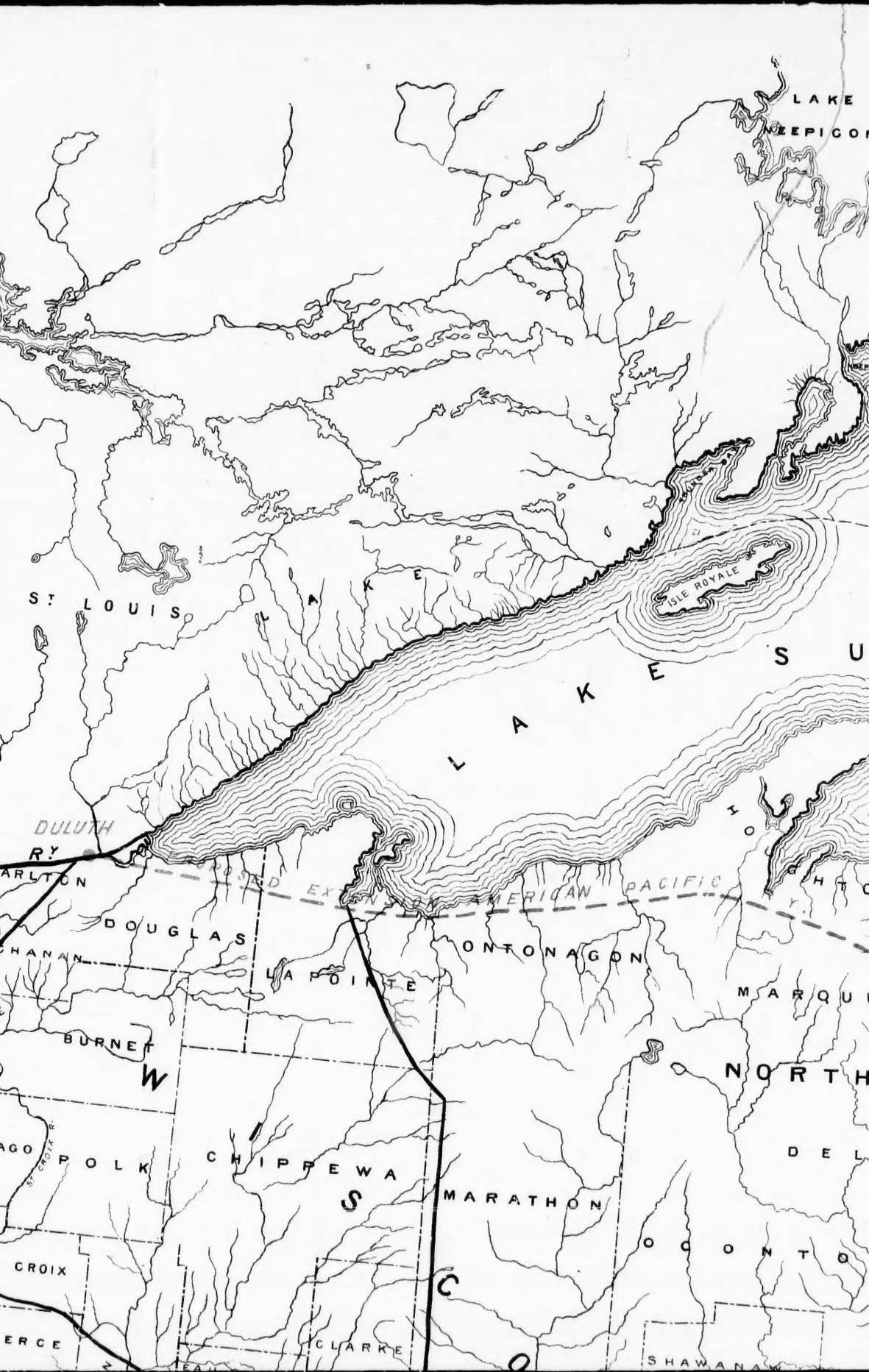
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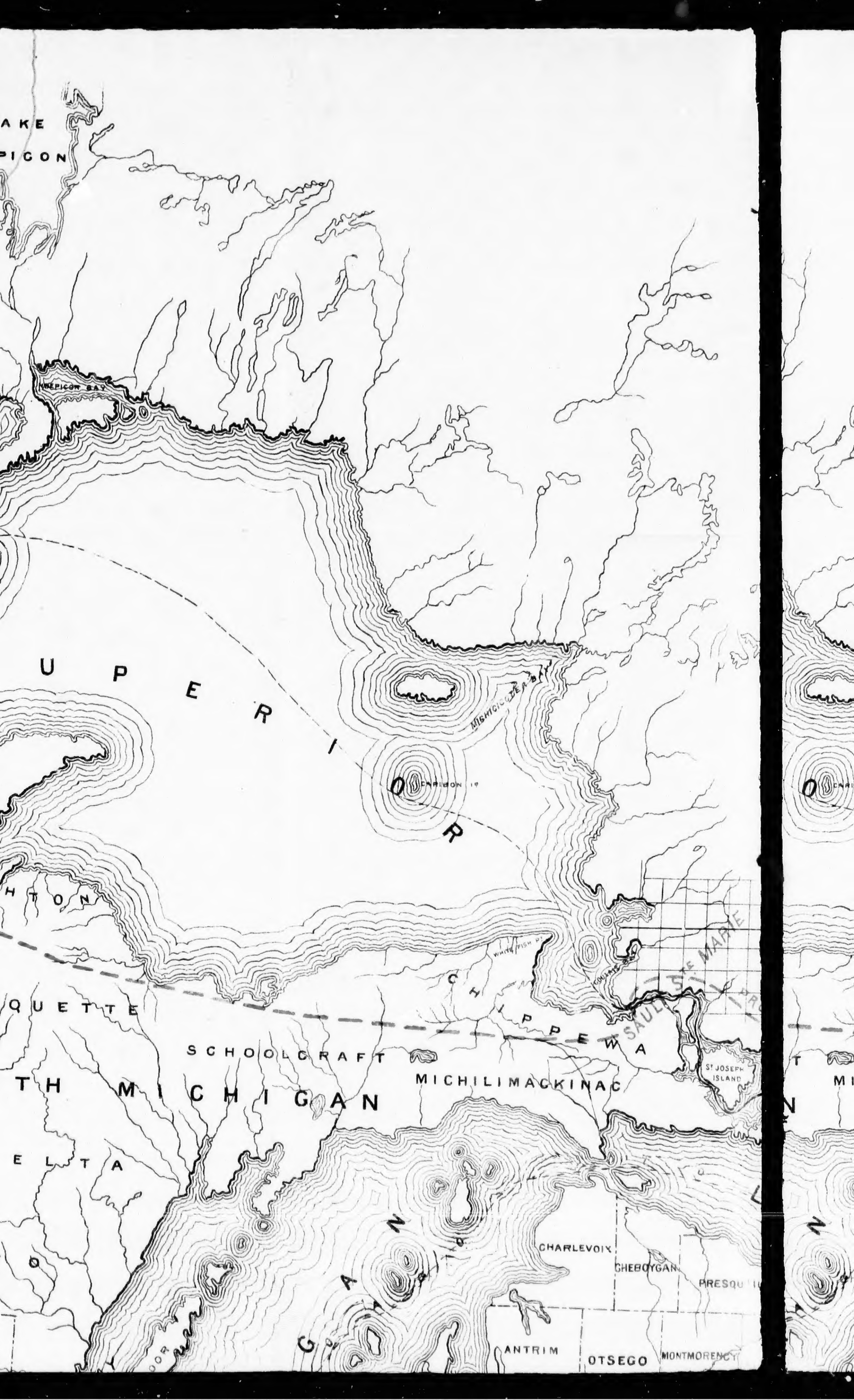

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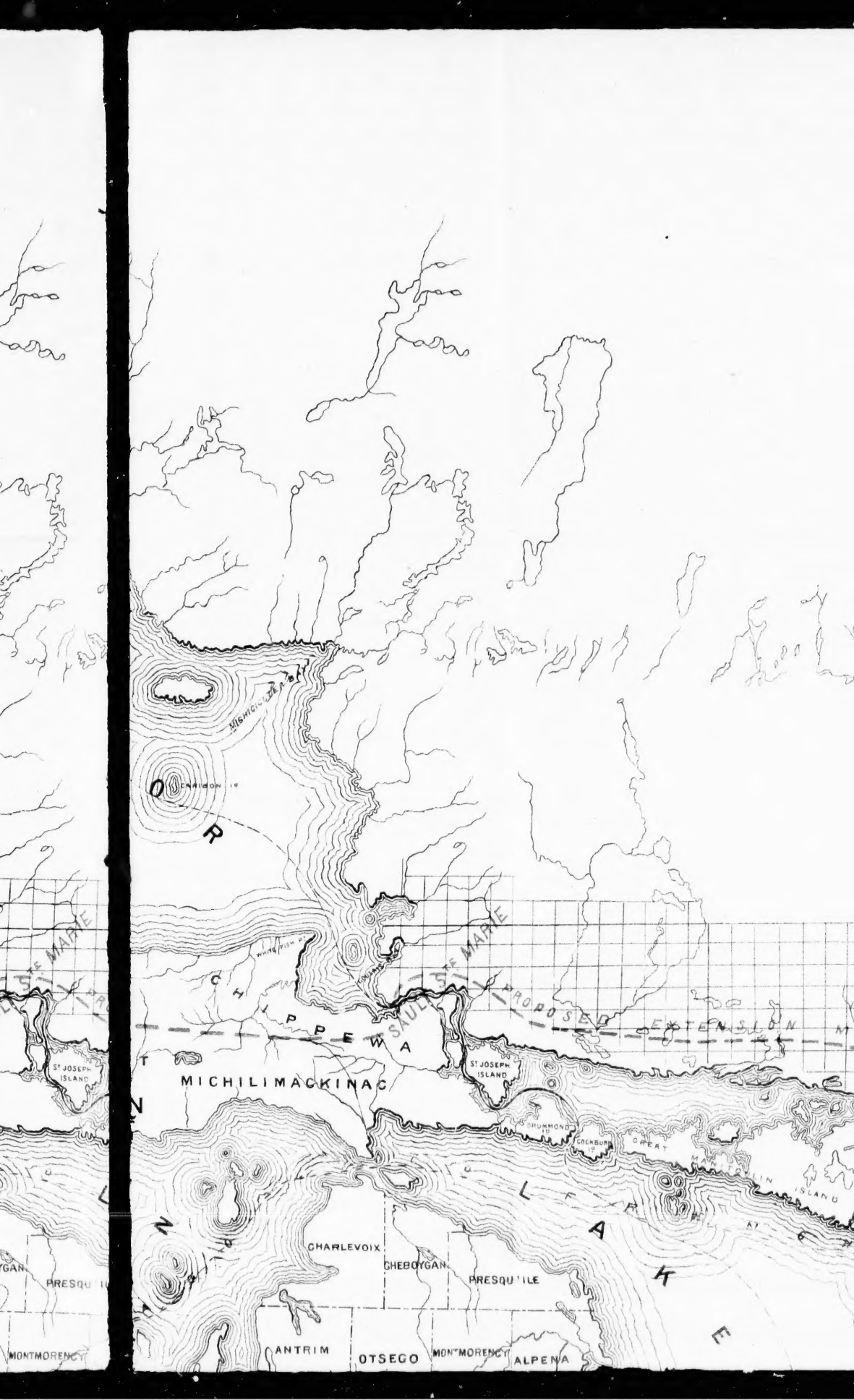
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MATTAWAN
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RIV.
GEORGIAN BAY
PARRY SOUND
PARRY SOUND AND
DEEP RIVER


MONTCALM
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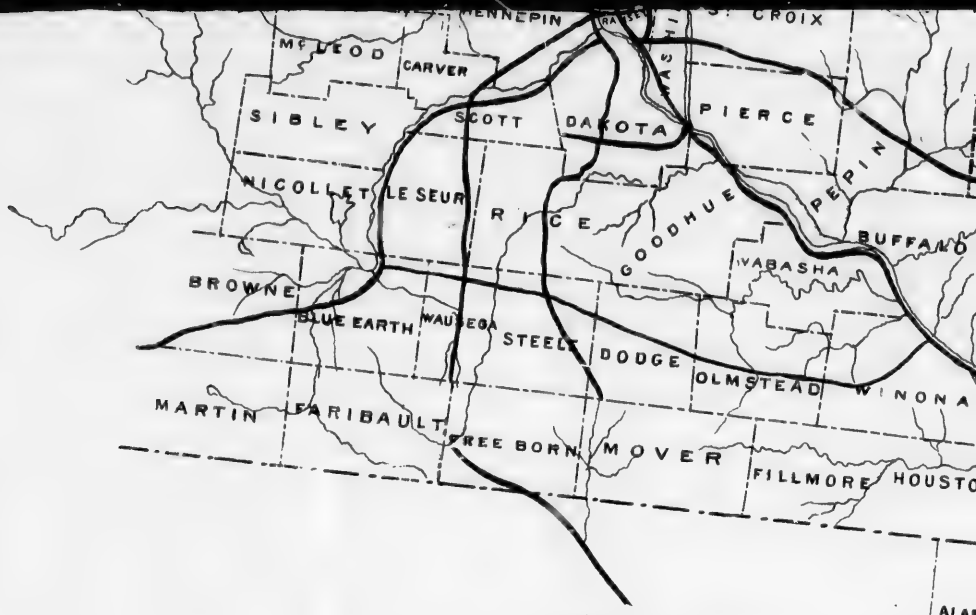

MAP

SHEWING PROPOSED LOCATIO

OF

MONTREAL NORTHERN COLONIZATION R

FROM

Montreal to Georgian Bay AND *Sault St.*

WITH RIVAL ROUTES

To Accompany Mr Lecce's Report.

GEO. BISHOP & CO. STEAM LITH, MONTREAL.

SCALE OF BRITISH STATUTE MILES.

0 10 20 30 40 50 60 70 80 90 100 150

ED LOCATION

NIZATION RAILWAY

y AND *Sault Ste. Marie*

ROUTES

CE'S REPORT.

TREAL.


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ANTRIM
OTSEGO
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CRAWFORD
OSCODA
KEWAUNEE
BROWN
MANISTEE
WEXFORD
MISSAUKEE
ROSCOMMON
OGEMAW
MANITOWOC
SOUTH
MASON
LAKE
OSCEOLA
CLARK
GLADWIN
SHEBOYGAN
OCEANA
NEWAYGO
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GRAND HAVEN
DETROIT AND MILWAUKEE
LAKE MICHIGAN
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LIVINGSTON
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KALAMAZOO
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JACKSON
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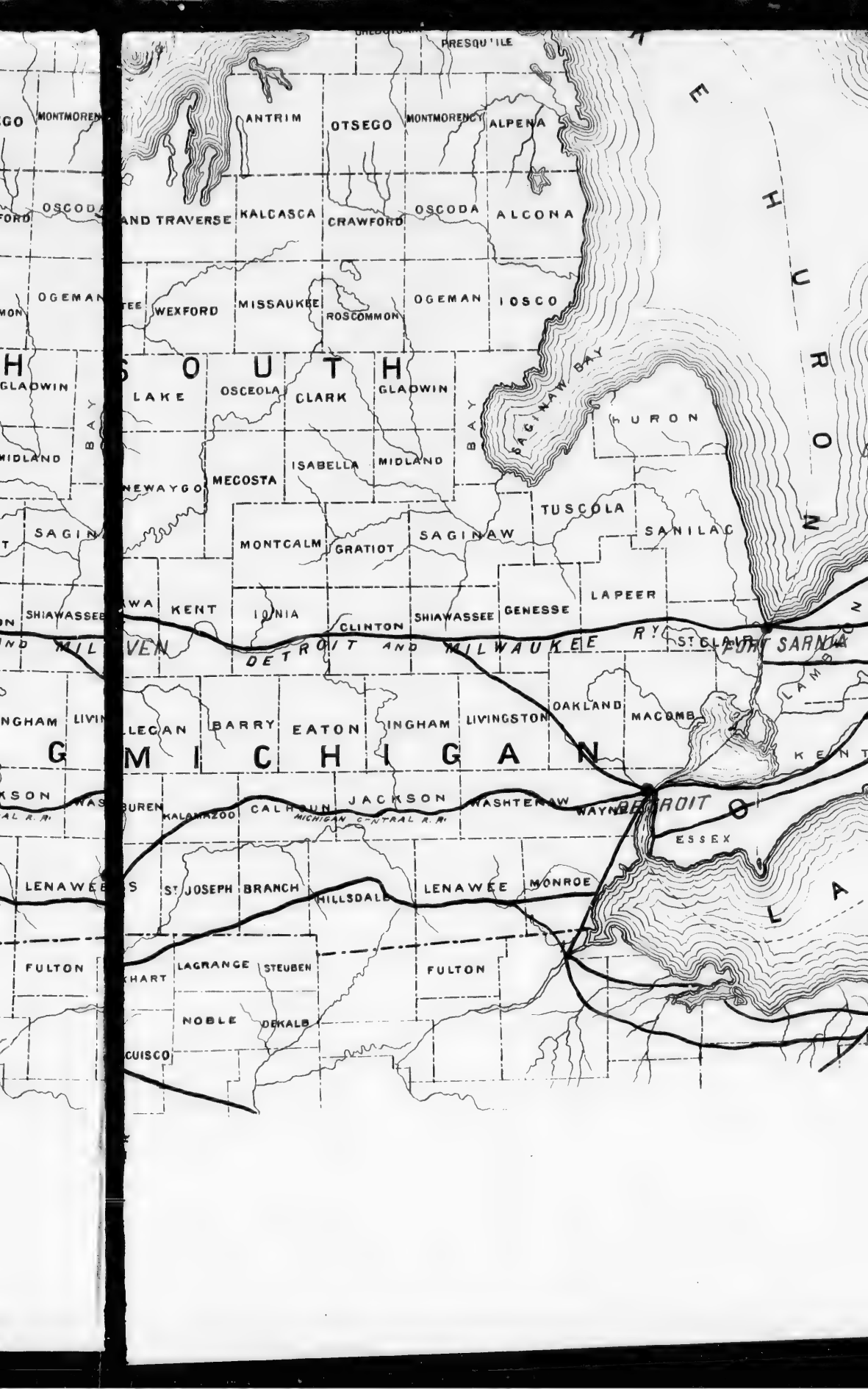
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FULTON
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NOBLE
DEKALB
HURON
ERIE
LAKE


BAY
COLLINGWOOD
GREY
BRUCE
SIMCOE
LAKE SIMCOE
YORK
ONTARIO AND QUEBEC RAILWAY
DURHAM
NORTHUMBERLAND
GRAND
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TORONTO
HALTON
WELLINGTON
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PERTH
OXFORD
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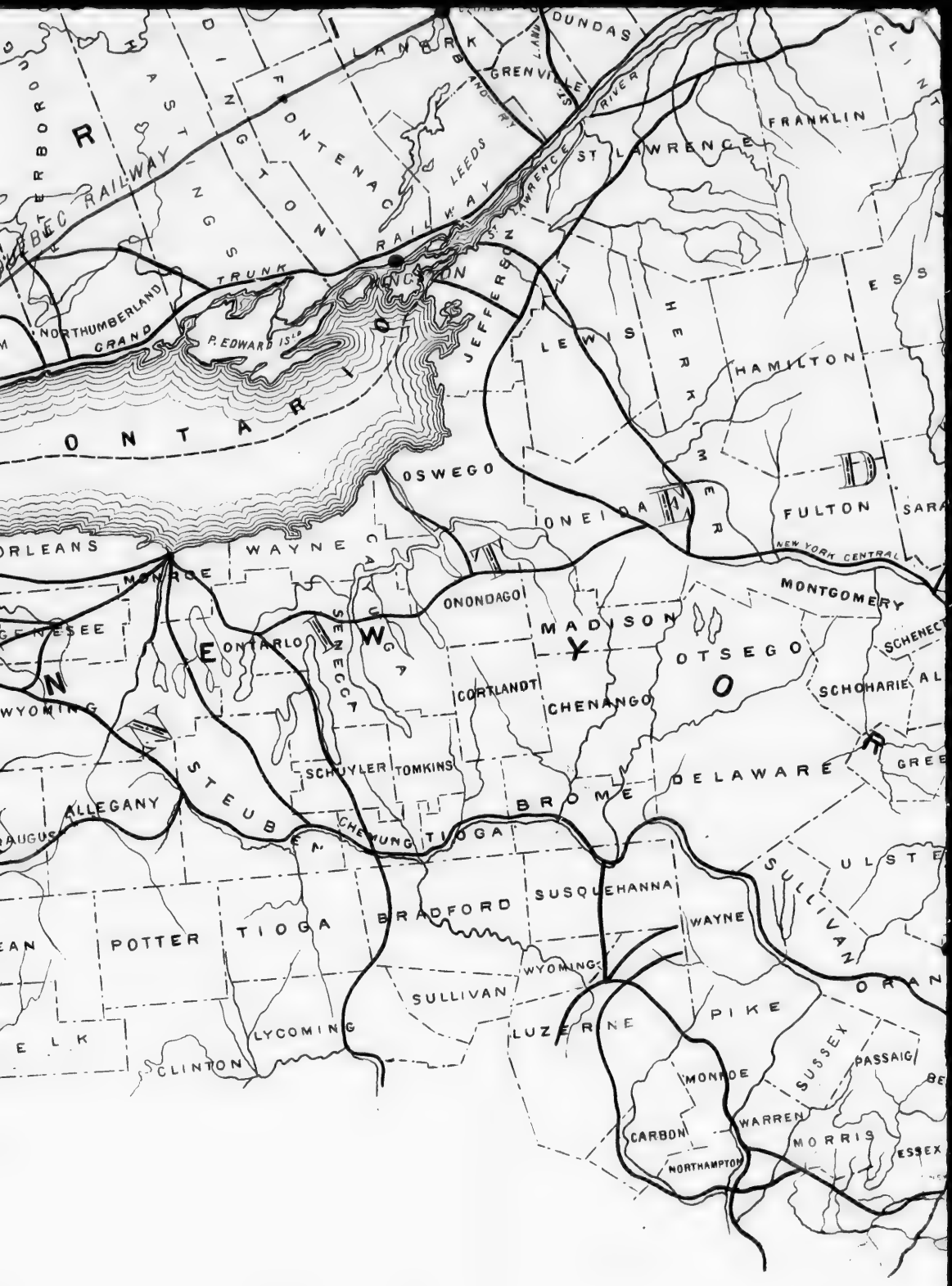
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MORRIS
ESSEX
NORTHAMPTON
LYCOMING
CLINTON

of Ontario, to the Georgian Bay, Sault Ste. Marie, and the navigable waters of Lake Superior; or to unite and amalgamate with any line of railway going to the aforesaid places.

The required Legislative authority for the extension and construction of the Railway having been obtained, it next became of importance to ascertain its probable location, and character of country to be traversed; the first with a view of combining as many interests as possible; the second, to form some idea of the engineering characteristics and probable cost of the work.

Of the entire Grand Trunk Line, the two first Divisions, from Quebec to Montreal, and from the latter place to Aylmer, comprising about 283½ miles, have been surveyed, placed under contract, and are now in course of construction. No special reference need therefore be made to those portions of the railway, further than to observe that the location appears to be in the interest of the country generally; joining the leading localities, and by means of branch lines, opening up the country to the North: at Montreal connecting with the Grand Trunk Railway, and its net work of connections, to the west, east and south; and at Ottawa, with the Canada Central and other lines converging to that important railway centre.

The route of the railway having been satisfactorily established to Aylmer, a village on the Ottawa River, about seven miles above Ottawa City, it then became a matter of anxiety with your Company to ascertain the additional distance it could be prolonged through the Province of Quebec, in its upward onward progress, to a union with the Eastern Terminus of the Pacific line at Lake Nipissing, and afterwards fulfilling its destiny by a junction with the waters of Lake Huron and Superior: having the assurance of the Quebec Legislature, that for every mile of extension through that Province, a handsome gratuity would be extended to the enterprise, either in the form of a land grant of 10,000 acres per mile, or a corresponding money subsidy. This action of the Quebec Legislature, was but a continuation of the benevolence already extended to the two first Divisions of the Trunk Line from Quebec to Aylmer, and had for its primary object, the patriotic desire of opening up for settlement the great North-Western Section of the Province; and secondly, the construction of a line which would with its iron grasp secure a portion of the great traffic of the upper lakes, and ultimately of that of the Inter-oceanic, on the construction of the Canadian and American railways to the Pacific Ocean. The subsidy promised by the Quebec Legislature, being considerably in excess of any amount which could be anticipated from Ontario, in the event of crossing into and carrying the line through that Province, made it of vital importance to your railway to keep the North, or Quebec side of the river, to the greatest extent which engineering considerations would warrant.

In the month of March, 1873, under instructions from your Board, an examination of the country was made between Aylmer and the foot of Deep River, a distance of nearly one hundred miles—Deep River referred to is not an independent stream, but simply a long and navigable stretch or reach of the Ottawa itself.

In a report on this exploration, under date of 3rd April, 1873, it is demonstrated that an excellent route can be had, following generally the course of the Ottawa River: the grades and curvature being remarkably easy, and the cost of construction, with equipment complete, not to exceed $30,000 per mile. In addition to the Government grant of 1,000,000 acres for the entire length of 100 miles, the county of Pontiac, through which the line passes, has taken stock to the extent of $150,000, leaving an estimated balance to be raised on bonds of but $850,000. An examination of the report will show local traffic of sufficient extent at present in exist-

ence, to considerably more than meet the interest on bonds and running expenses, without reference to the future through traffic to flow over the line.

The foot of Deep River reached, the exploration at that time terminated; as in the opinion of all persons with whom I conversed, and acquainted with the topographical character of its banks, it would seem impossible to carry the line on the North side, above the point then attained, on account of the precipitous and high banks on the Quebec side.

These verbal opinions of people to the manor born, appeared also to be much strengthened by Mr. Shanly, who, in his able Report on the Ottawa and French River Navigation project, thus refers to the physical characteristics of this region:—

"For seventeen miles from the Matawan Rapids, the Ottawa con-"tinues very wide, direct and deep, and though with a decided "current, is a splendid piece of natural navigation the whole "way—the banks are for the most part bold, precipitous and "rocky, the scenery very grand." Speaking of the Deep River Section, he observes:—"On the South of this superb piece of water, the general "conformation of the country is that of an elevated and comparatively level "plateau, the prevailing character of the soil being dry and sandy, the "forest nearly altogether of red pine and white birch—on the North side "very mountainous scenery prevails; all that can be seen of the country "in that direction as one passes down the river, being harsh and barren, "with the syenitic rocks frequently towering up perpendicularly to vast "heights above the surface of the deep water." Again in speaking of the Ottawa River at its confluence with the Matawan, Mr. Shanly states it to "possess a width of 1,500 feet, and very deep"—conditions which would necessitate a very expensive bridge, in the event of crossing at that point.

The natural impression to be derived from the foregoing, would be inimical to the economical construction of a railway through the region described; but as up to this period our road in its progress from Montreal to Deep River, a distance of about 218¼ miles, had so frequently encountered supposed impassible physical difficulties, which, on examination, entirely disappeared, and a country obtained that for facility of construction leaves almost nothing to be desired; one could well be pardoned for being a little sceptical, if the same results would not follow an exploration of the remaining distance to the Matawan of some eighty miles. Strongly impressed with this opinion, I ventured the suggestion in the report referred to, that before deciding on crossing into Ontario, either at "Portage du Fort," "le Passe," or at the "Foot of Deep River," a thorough exploration be made of the country between the Foot of Deep River and Matawan on the Quebec side of the Ottawa—when if a good route could be obtained, the financial position of the company would be materially strengthened, by the assistance which no doubt would be granted by the Quebec Legislature, in aid of the enterprise.

Acting on the above recommendation, the present exploration has been ordered, and though when approaching the, to me unknown region, it was attended with some degree of "fear and trembling," as to the results, yet I am now happy to state that the examination has confirmed the previous impression that a good route may be had.

Placing the map before you to enable a more clear understanding of the localities, I will now proceed to give a brief description of the route traversed.

Starting from the termination of the last exploration, about three miles north of Fort William, a valley leads the line gently down to the north shore at the foot of Deep River—and as from this latter point to the

Matawan, with some four or five exceptional places, the character of the bank is uniform, and mode of construction similar, the latter will be generally described, and the more difficult localities separately dealt with.

At first sight, to the unprofessional eye, the construction of a railway along the banks of the river would be pronounced impracticable, almost at every point—the mountains apparently rising from the surface of the water to such great heights—a closer inspection, however, will reveal peculiar facilities for the economical location of a line of railway, both as regards its first cost, and the future working of the traffic.

From the foot of Deep River to the Matawan, a distance of about eighty miles, the general course of the River is very direct—with a total fall or declivity of 133 feet, or but little over an average of 1 foot 8 inches per mile.

With the few exceptions to be mentioned, the face of the mountain slopes back from the water with an inclination of about 45 degrees, or one to one—in many places a narrow berm or natural bench exists between the water and foot of the slope; while, in other instances, the slope springs directly from the water. The side surface of the mountain is covered with a dense growth of small trees, supported by soil and *debris* washed down from the heights. On this natural slope in many places, it is proposed to "bench in" for the road bed of the railway. The material excavated on one side being merely thrown over as embankment, and forming a widening of the bed on the other. In other places the natural margin along the shore will be utilized, carrying the rail level at a uniform height of from 15 to 20 feet above the level of low water in the Ottawa, or sufficiently elevated above danger of the freshets, which prevail during spring months. Deep catch-water drains will be required on the upper side of the track, to convey the surface drainage flowing down the hills, to the box-culverts through the track—although so long as the thick growth of trees and shrubs remains, the melting of snow will be gradual. With this arrangement of track, a practically level grade will be obtained for the entire distance of eighty miles; the rails will be above snow level, as it is not likely to lodge on the road bed, or if so, can be easily thrown over by the plough. No land to be purchased, or fences, cattle guards, farm and public crossings to be constructed, and but seven small streams to be crossed, with bridges of from 50 to 100 feet spans, placed on good foundations. Running parallel and close to the navigable water, the delivery of rails, ties and other material used in construction, will be much facilitated and cheapened over any railway passing through an uninhabited and difficult of access country.

Referring now to the several localities mentioned, as being exceptionally difficult of construction, or differing in character from the sloping face presented by the bold shore—we will describe them in regular order, starting from the Foot of Deep River.

1st and most serious of all is a high precipitous rocky point projecting into the river, or rather running nearly parallel with it, and known as "The Oiseau," several miles above the starting point. This is the only place where the sloping characteristic does not obtain, and in one place for a short distance actually over-hangs the water. Fortunately however, its face in line of the river does not extend over one-fifth of a mile. Several modes of overcoming this obstruction may be mentioned and the most feasible and economical of them adopted, after a thorough survey of the locality will have established the preferable one.

1st. By blasting off the front edge of the cliff, to a sufficient depth to establish a bench for the reception of the track.

2nd. A pile bridge in front of the cliff, if the w[illegible] too deep.

3rd. A pontoon-bridge for supporting the tr[illegible]

4th. A tunnel of about one-fifth of a mile, t[illegible] ocky point.

The latter mode at present would appear the most desirable one for adoption, as its centre line could be placed in such direction as to strike the inclined slopes of shores at either end, with the *minimum* of rock excavation.

At first sight, this "Oiseau rock," claimed to be the fatal or stopping point of our North Shore line, presents rather a startling aspect, but a closer examination of the locality, and slight knowledge of the enormous forces exerted by the explosive compounds modern chemistry has discovered, will convince the engineer that if no greater obstacle is to be encountered in the onward progress of our Northern line to Lake Huron, than the one in question, its success, in an engineering point of view is a certainty. On many railways in Europe and America, a tunnel of one-fifth of a mile in length is of small account, and may be so regarded in the present instance. Leaving, therefore, this so-called "first sticking point," and proceeding onward, we find the second *Interesting locality*, opposite McQuestin's, eight miles above the foot of Deep River. At this place my first view of the north side was obtained from the opposite shore, and certainly was far from creating a favourable opinion as to the prospects of obtaining a line at that point. For at least one thousand feet along the river, the bare granite rock arose, in all appearance precipitously, to a height of from three to five hundred feet above the water. Passing on the ice along the foot of this great cliff, and noting carefully its outline, a simple and cheap method suggested itself for carrying the railway track past, from the sloping portion of the bank, at one end of the obstruction, to the same at the other. Near the surface of low water, even at the most critical point, a level berm can be had in the solid rock of about three feet, amply sufficient when checked out, to receive the ends of vertical wooden posts for bents. From this point to a height of twelve or fifteen feet, the rock slopes back about ten feet from low water line, and for the remainder of the great height, appears like a vertical solid wall of granite. The wooden bents should be placed at distances of ten feet, and consist simply of vertical posts on the outside, of sufficient height, to carry the track above high water. The horizontal caps resting at the outer ends, on the tops of these posts, will be supported at the inner ends in horizontal checks, cut into the slope, and firmly bolted to the rock. Longitudinal stringers will be placed along, and securely bolted to the various bents, for carrying the cross ties and rails. The bents will also be connected together and strengthened by horizontal and diagonal braces.

In this simple, cheap and efficient manner, the great difficulty disappears, and our rail track passes on the solid rock foundation to the adjoining slopes, where the construction will be as before described. Reaching the head of Deep River, or "Les Deux Joachims" the Ottawa takes a sudden bend, in a simi-circular form, and afterwards resumes its original course. Across the neck of this bend, some three miles in length, there exists a ravine, which the line can follow and again strike the sloping bank at or near "Ferres's Clearing," above the rapids.

From "Les Deux Joachims" to "Rocher Capitaine," about sixteen miles, there is nothing remarkable, or requiring special notice; at the latter place, the grandest of the magnificent rapids of the Ottawa, the line will leave the river and follow for two miles a direct course through a ravine, to smooth water above. A vast deposit of most excellent gravel exists at this place, close to the line, and could be used for ballast in each direction. At and in the neighborhood of "Les Deux Rivieres" an additional distance of ten miles, there will be some rock excavation, but of no great extent. Three miles above, a considerable deposit of limestone is found on the river bank. I was also shown excellent samples of grindstone, said to be obtained in this locality.

Passing upward from Les Deux Rivieres, about twenty-two miles along the sloping banks, we reach the River Matawan, one of the principal tributaries flowing into the Ottawa from the West, and the proposed termination of our exploration, in so far as the Ottawa Valley is concerned, *at the present time.* To this point, a distance of 291 miles, north-west of Montreal, our line has followed from Grenville, in the deep groove cut out by the waters of the great Ottawa River. In doing so, that great *desideratum* of modern railway engineering, low grades, has been obtained to an extent, which but few persons acquainted with the general character of the country could have anticipated. This great requisite for economical transport, is also coupled with a general directness of course which leaves nothing to be desired, when viewed either in relation to a future connection with Georgian Bay, the Northern American Pacific, at Sault Ste. Marie, or the great Canadian Pacific line *viâ* North Shore of Lake Superior. At the same time planted within the Province of Quebec, to which up to the present, it owes so much, a distance exceeding 450 miles. For over one-half the entire length, the line will pass almost within rifle shot of the sister Province Ontario, and will extend equal advantages to that section of the Dominion. The Ottawa River consists of long stretches of comparatively still water, freezes over in the winter, and furnishes a natural bridge for traffic to and from the railway, while during the open season, ferry-boats and bridges at various points will continue the connection. Leaving the consideration of other natural advantages of the proposed location to an after part of the report, the description of the exploration will be resumed.

My instructions indicating the mouth of French River as the point aimed for, it becames necessary to cross into Ontario at or in the neighborhood of the Matawan. From Mr. Shanly's reported width, 1,500 feet, and great depth of water, it had been a subject of considerable anxiety, before arriving at Matawan, as to the character and cost of the bridge for spanning the Ottawa at that place—difficulties which would also be enhanced in the event of both shores continuing to preserve their almost Alpine character.

Reaching the Matawan, a slight examination served to dispel all doubts, and gave assurance of Nature's handiwork in preparing the way for the bridge at this place, in such a manner as indicated by no other locality between Matawan and Montreal.

About one quarter of a mile below the village, and mouth of the Matawan, the point of crossing must be made. Here we find on the north side an indentation of the bank, the hills falling back some distance from the river, leaving a comparatively level plateau to swing the line back from the river, and afterwards curve and approach the bridge, to be placed nearly at right angles with the current. On the Ontario side at this place, the high bank has also fallen away, leaving a large extent of level country to the south, over which to swing the line as may be required, and sufficiently high above the water, for the rail to strike.

On the proposed site of the bridge, a rocky point, bare at low water, runs out into the stream, at the head of the rapids; reducing the water way to some three hundred feet at that stage of the stream. This channel of 300 feet is divided into several smaller ones by rocks projecting above the surface and forming good foundations for piers—the greatest depth of water at the time of examination did not exceed six feet.

During high water, of course a much greater volume will pass this point, and, as a measure of safety, it will be well to provide at least 600 feet of bridge for waterway. The foundations of piers being put in during low water, comparatively on dry rock, and other works of construction under like favorable circumstances, the cost of the bridge will be less than any other of a similar

length on the entire line. The lower chord or bottom of the bridge should be about fifteen feet above high water, or say thirty feet above low water, to admit the passage of rafts, and enable the rail level to conform economically to the surface of the ground on the south side of the river, where a city will no doubt spring up in the future, and with a fine site to develop on.

Getting so well over the anticipated difficulties at the mouth of the Matawan, attention was now directed to the additional route to be explored through Ontario.

From the mouth of the Matawan to that of French River, where it discharges into the Georgian Bay, and selected as the entrance of the proposed Canal, is a distance of 115 miles, as measured on the map, with a suitable allowance for curvature. The crest of the water-shed between Lake Huron and Ottawa River takes place about Trout Lake, some thirty five miles from the latter River, and given in Mr. Shanly's Report at 170 feet above the mouth of the Matawan. This, on the assumption that the level of the country conform to that of the water, will give an average elevation of nearly five feet to a mile. From Trout Lake to the mouth of French River, the distance may be roughly computed at 80 miles, with a fall of eighty-three feet, or slightly over one foot to a mile average declivity. With this supposed generally very favourable condition of summit level to be surmounted by the rail traffic, it only remained to discover the route which will give the most even contour of profile and minimum of earth-work, keeping in view, however, the desirability of touching Lake Nipissing, at some point where a facile connection can be made between the railway and water traffic, yet to exist on the large inland sea.

This fine sheet of water is of irregular shape, from forty to fifty miles long, and twelve to eighteen wide, receiving the waters of seven rivers; two of them, the Sturgeon and Nahmanitigon, or South River, of considerable size. The south and west shores are bold, and the depth of water great. The north and east shores are low and flat in places, and the water shoals gradually. The western end of the Lake is filled with Islands, and the shores are cut up into inlets, ending in marshes.

With the railway in operation, and touching the navigation at some convenient point, I have no doubt a great traffic in lumber will be derived from those waters—passing easterly in the direction of Montreal, southerly in that of Toronto, and westerly to Lake Huron, there to be transhipped to the prairie cities of the North Western States. The lake during the winter is entirely frozen over, and by means of the ice, during that season, and boats for the balance of the year, easy connection can be had with the entire surrounding coast of the lake, and its tributaries.

An examination of the valley of the Matawan, and lakes through which its waters pass, convinced me that the idea of carrying our railway in that direction was quite impracticable; the line of the shore being very irregular, with in many place, towering rocks arising precipitously from the water's edge, and baffling any attempt to pass them, except on the ice or in canoes.

The character of the shores having thus changed from that generally existing on the Ottawa River, the idea of following with our railway the line of the future canal navigation, had to be abandoned at the Matawan. Even were it possible to do so, the direction would not have been desirable, as on striking Lake Nipissing at "Riviere de Vase outlet," the course of the line would have to deflect southerly, to pass the lower end of the lake, and add considerably to its length.

Drawing a line from the proposed point of crossing the Ottawa at Matawan, to the most southerly bay of Nipissing, near the mouth of South River, and keeping from five to seven miles South of Lake Talon, will pass

over a comparatively level country, and is the section which should be examined instrumentally. Some curvature will of course be necessary, to avoid hills and small lakes, but the general character of the ground will be found very favourable, and much of the land well adapted for agriculture.

Arriving at South River, the point where a union of the rail and navigation of Lake Nipissing is to be effected, we find a stream of considerable magnitude, twenty miles or more in length, taking its rise in Ontario, flowing northerly and emptying into a large bay at the South corner of Nipissing. It is navigable for three miles from its mouth, with a width of from 100 to 200 feet, and of ample depth. The first fall of about ten feet then occurs, furnishing good mill sites. Some two or three miles further up, a second and more extensive descent takes place, also giving good mill powers. At this latter place, saw and grist mills are in course of erection for the benefit of settlers.

The land for a great distance east and west of this river, is very level and will yet furnish farms equal to any part of the Dominion.

A winter road has been cut through in a south westerly direction to the Meganatawan River, a distance of 34 miles, and will be grubbed and graded during the present season, by the Ontario Government.

At the mouth of South River there is a small settlement of nine families —one of them, in possession of 400 acres, with 200 cleared, and producing excellent crops, the produce being sold to lumber establishments; hay bringing $50 per ton, and oats $1.50 per bushel, with everything else in proportion. From this place south to the Falls of the Meganatawan, 34 miles, there are no settlers, although the land is generally of the best quality, heavily timbered with maple, beech and birch. I was informed however, that during the coming summer, a large influx of settlers will take place. From the Falls of Meganatawan, to Parry Sound on the Georgian Bay, a good road exists, and that part of the country is fast filling up with inhabitants. I mention these facts to show that the country around Lake Nipissing, is not altogether of the rocky barren character which many people judge it to be, who have simply passed up the Matawan, and down French River in canoes, and who confound their rocky shores with the country a few miles beyond: that in a few years, or even before the railway can be built, a large population will exist at and in the neighborhood of Nipissing, dependent on the road for transport, where now but a few wandering Algonquin Indians are met.

The line of railway will probably cross South River, near the first Fall, where the depot can be placed, and surrounded by the future town. Sidings can be extended on each side of the river, towards its mouth, and in this land-locked water, protected from storms on the lake, vessels can load and unload with safety.

Having arrived successfully with the line at this important point, without encountering engineering difficulties of more than an ordinary type, the final and not the least important section of the route had now to be determined, to the mouth of French River; or to some harbor on the Georgian Bay readily accessible to vessels.

This River, with a length of fifty miles and fall of sixty-seven feet, forms the outlet of Lake Nipissing, and may be more properly described as a succession of lakes, than a continuous river—the descent being made in a series of level terraces, with rapids or falls occurring at intervals in contracted channels, or river portions; the latter being for the most part narrow defiles from two hundred to four hundred feet in width, walled in by towering cliffs of the unchanging granite, or its kindred rocks the syenite and gneiss,—the lake portions are studded with islands, while here and there, vast bays indent the shores. No possibility presenting itself of a re-

petition on this river, of the plan adopted for the Ottawa, by carrying the track along the water's edge, a line had to be sought some distance from it, as in the case of the Matawan. "The mouth of French River" mentioned in the Resolution, as the point to be aimed at, being somewhat indefinite, from the circumstance that the stream boasts of seven independent estuaries, extending over twenty miles of coast line along Georgian Bay, I was led to the selection of the most northern but two, by the considerations that in making that point, the course of our line would lead more directly for the Sault Ste. Marie; a place ultimately to be sought, in order to obtain through traffic during the winter season, and also largely from the circumstance, that this outlet was the one selected by Messrs. Shanly and Clarke for the proposed entrance into the Ottawa and French River canal navigation: That here would probably be found a good harbour, and eventually all the adjuncts of lighthouses, piers, buoys, wharves, warehouses and elevators, common and essential to the two systems of transportation; one being the complement of the other.

From South River to the outlet of French River referred to, a distance of about seventy and a half miles, there are no settlers or even lumbermen: several Indian families only existing, to slightly relieve in company with wild animals, the dreary solitude which pervades this region—a dreariness rendered more striking and gloomy by the effects of fires, which have devastated large tracts of forest in the neighbourhood of French River.

Referring you now to the map, the general course of the line selected will be seen—At the distance of thirty-five miles, it will be from six to eight miles south of French River passing either north or south of several lakes there existing, according as instrumental surveys may determine best for adoption. At this place it was thought desirable to start the exploration from the mouth of French River in the opposite direction, to the point where the previous examination had terminated; and with this view, to secure guides acquainted with the main mouth of the river and intervening country, we pushed through to Byng's Inlet, a deep bay putting in from the Lake, and forming the nearest inhabited point on the coast, about twenty miles south of the French River outlets. Arriving at this locality, an examination was made of its capacity and capabilities for forming a harbor; as also a place of connection with the railway, in the event of having to strike so far south with the line. A more detailed account will be given of the information gathered, at an after period in the report, and in the meantime attention will be drawn to the results arrived at farther up the Bay.

Securing the services of three supposed experienced guides at Byng's Inlet, who professed an intimate acquaintance with the localities, and the ability to guide us directly through the myriads of intervening islands and channels to the "*Large river*" marked on Bayfield's chart, and indicated in Messrs. Shanly and Clarke's reports, as the entrance to the proposed canal navigation, we left the Inlet for the latter place. A blinding north-west snow-storm commencing shortly after our departure, coupled with the inability of our guides to follow the trail, caused the loss of four days, during which time we explored various indentations of the coast, in some respects bearing a resemblance to the point sought, but in others differing materially. Abandoning the idea of our guides' infallibility, we returned to Byng's Inlet for others, and provisions, when the weather clearing up, we were taken directly and without trouble to the mouth of the large river, recognizable at a glance as the "Terminal Harbor of the Ottawa Ship Canal," so graphically described by Mr Shanly, in his already alluded to report of 22nd March, 1858.

In giving a description of this, to your railway, most important point, I cannot do better than clothe it in the words used by that distinguished

engineer, confirming his remarks and adding a few observations in relation to the rail connec' on with the locality.

On page 16 of this valuable Report, we find the following, under the caption of "Terminal Harbor on Lake Huron:"—"I ascertained that the "prevailing opinion with respect to the entrance of the French River was "not favorable to the project of opening a navigable communication by "that route with the Ottawa. It was represented that the approach to the "river was so barred by reefs and rendered so intricate by the maze of "islands, multiplying its outlets into innumerable deltas, that only the "most skilful Indian pilots could thread its labyrinth of channels, so as to "steer their bark canoes into the main trunk of the river.

"I have already in this report had occasion to refer to Admiral Bay- "field's charts of our Lakes, the accuracy of which is proverbial amongst "those who "occupy their business" in those "great waters." Singu- "larly, however, an error or oversight in nomenclature on that portion of "his chart of Lake Huron, which shows the outlet of the French River, "goes to strengthen, if indeed it does not originate the opinion referred to "as common among the casual visitors to that coast, viz., that the river is "not accessible for any craft bigger than a birch bark canoe. I would "direct your attention to sheet No. 3 of Bayfield's charts of Huron, and "with it before you, to a group of islands in its most easterly angle, known "as the "Bustard Islands."

"Looking northward from this point of observation, you will see the "'Mouths' of the French River, noted in conspicuous capitals, debouch- "ing amid a number of little islands. Turning due east you will observe "an inlet named the 'Key,' also figuring in capitals, while between it and "the first named point, is another indentation of the coast, setting up from "which, but noticed only in unpretending italics, is a 'large river.'

"The Indians of Lake Nipissingue, in going to and from between their "homes and Shebanowhenaning, and the Sault Ste. Marie, commonly "enter or descend the French River by the 'Mouths,' so designated by "Bayfield, that route affording the best shelter for their canoes: in going "to or returning from Penetanguishine, they commonly choose the pas- "sage by the 'Key,' the waters of which, although they do not belong to "the French River, approach so near to it, at some distance up, as to ren- "der it accessible for canoes by an easy 'portage.'"

"In pursuing my examination of the coast, I placed myself entirely in "the hands of my pilot, a sagacious Algonquin, of Lake Nipissingue, perfectly "familiar with every rocky island and inlets, of the myriads that stud and "indent the inhospitable coasts of the Georgian Bay, merely giving him to "understand that my desire was to enter the river by its widest and deepest "estuary.

"Passing the "Key," which he indicated as the shortest route to "Nipissingue, my guide bent his course for the Bustard Islands, and from "thence steered directly for the "large river" already referred to, the way "into which from the Islands being perfectly clear and unembarrassed. It "thus for the first time became known to me that the French River had "at least one outlet independent of those assigned to it by the chart, and "that the "large river," which most probably was considered by Bayfield "as a distinct stream, is in reality that arm of the former by which, if ever "it is to be adapted to the purposes of modern commerce, vessels will have "to enter it. As for the other mouths, I have ascertained that they were "rightly pronounced to be inaccessible, save, as before observed, for the "Indian in his canoe.

"On reaching the mouth of the river, I landed, and looking back upon "the bay, over which I had just passed, it certainly did seem to fulfil all "the external conditions of a noble harbor. The Bustard group completely

"protects it on the south and south-west, while a heavy sea grinding "angrily against a projecting headland of granite on the north-west, seems "to announce some shelter against the violent gales which so frequently "assail the Lake from that quarter. The bay within was perfectly smooth "and unruffled, while without the water was still heaving and swelling from "the effects of a night of storm.

"The entrance to the harbor is studded across, from the Bustards to- "wards the main shore on the north, by a few rocky islets, great broad "channels between which give every indication of very deep soundings. "Close under the Bustard Islands the chart marks sixty feet of depth; in "the mouth of the river I paid out twenty feet of line without touching "bottom.

"The intermediate bay, doubtless, has some of those treacherous "sunken rocks which beset the whole of that coast, but the general depth "of water is great, and deep channels of ample width exist throughout "the whole bay into the entrance of the river. The reefs and sunken "rocks referred to are almost sure to be of the pinnacle form which char- "acterizes the rocks and islands *above* water, and as they stand up like "pyramids, with deep soundings all around them, are therefore suscept- "ible of being removed without extraordinary difficulty or cost, involving "a description of work, in fact, which, as it would be permanent in its "results, would prove of less ultimate cost than the endless dredging of "the ever silting harbors of Lakes Erie and Ontario.

"A vessel of whatever class, steamer or sailing craft, once within the "Georgian Bay, could in any weather, at least as easily make the Bustard "Islands, as any of the more southerly ports, Owen Sound, Collingwood, or "Nottawasuga; while in the sweeping gales from the Northwest, the scourge "of Lake Huron, the run from Cape Hurd to the Bustards, having the "shelter of the great Manitoulin Island, would assuredly be far safer than "that to any of the three lower harbors named. Under the lee of the "Bustard group, vessels could anchor or moor in the most complete "security, blow the wind from what quarter it might, and to drop thence "into the river, the depth and directness of the channel being assured as "sufficient, would be practicable under almost any condition of weather "short of actual storm. I consider the harbor formed by the Bay of the "French River, described above, as capable of being rendered in every "respect suitable for the entrance of a great ship canal. The ordinary "adjuncts of lighthouses and piers would of course be called for, and a "careful survey required to determine the proper site for such erections.

"It was my intention to have made such a survey in the summer of "1857, had I been permitted to proceed with the work embraced in my "first instructions.

"THE FRENCH RIVER.

"For more than a mile from its mouth upwards, the river is broad, deep, "and still; in width from three to four hundred feet; in depth probably "twenty feet. The banks are of bold granite, that on the north side pre- "senting the appearance of a monster artificial breakwater or pier, rising "perpendicularly many feet above the water and jutting out far into the "lake, affording to the entrance complete protection from the blustering "winds of the north.

"At the end of a mile or more from the entry, on rounding a sudden "bend, we come upon the first, or more properly speaking the last falls of "the river, having a descent of about six feet, and in form resembling an "artificial weir: the width of the fall being scarcely one hundred feet, "and the drop from the higher to the lower level almost perpendicular.

"On the north side the granite rises up boldly from out the water, while "on the south there lies a flat table of the same character of rock, its sur- "face but little elevated above that of the water in the upper reach, "and the portage over which from deep water below to deep water above "the cascade, is not four hundred feet. This table rock is admirably "adapted for the reception of a lock. Such a structure of the largest re- "quired proportions would almost occupy its whole area, for in width it "can scarcely boast of one hundred feet, when it is overshadowed by a "beetling cliff of the same imperishable formation, as that upon its "opposite side."

The foregoing copious extract has been given for the information of the Board, as Mr. Shanly's Report is now almost out of print, and probably not easily accessible to many of the Directors. Having passed on the ice over the identical route followed by Mr. Shanly in his canoe, to the last fall of French River, and having previously examined the channels and inlets along the coast to the south, I have no hesitation in confirming all that gentleman has written regarding this noble harbour; regretting however that he had not been allowed to complete the survey by a thorough system of soundings in the outside harbour.

While on the spot I ascertained from one of the guides that he had been employed by Mr. Clarke during his survey of this same project in the year 1859; that a very elaborate examination had been made of the outer harbor including the entrance into French River, to the site of the first lock: the soundings having been taken at short distances. That to the best of his recollection extensive reefs were found outside, carrying not over seven or eight feet draft. If this were so, of course it would detract from the character of the harbor, and having no copy of Mr. Clarke's report with me at the time, for reference, some degree of uncertainty was created by the guides remarks. I may here state that on returning I called at Ottawa, and through the courtesy of Mr. Page, Chief Engineer of Dominion Public Works, had access to Mr. Clarke's report, from which the following is an extract—Speaking of the principal mouth of the middle outlets of French River, he states:

"This debouchment of French River is entirely land-locked. To the "west lies a large group of Islands known as the 'Bustard Islands' which "completely shelter the mouth of the River from the westerly and south- "westerly winds of Georgian Bay. The main land affords protection from "the northerly winds.

"The channel to the entrance of French River lies at the northerly "extremity, and close under these island. There appear to be several deep "and broad channels divided by sunken reefs, and I am confident that a "spacious entrance can be marked out free from these treacherous sunken "rocks which mark the whole coast of Georgian Bay."

And in a foot-note he adds:—

"The mouth of French River is a deep fissure or cleft in the rock, ex- "tending from the lake into the land. Its course is about north-east and "south-west, which is that of the "strike" of the strata in that locality "and consequently of the ridges on land and the reefs in the water. Thus "although the navigation is dangerous to those who are coasting, and have "to pass over the ends of the reefs, there can always be found a direct "entrance between them, unobstructed by shoals or sunken rocks. I have "myself sounded from the foot of the "Petites Dalles" (the last fall) out "into the open Lake and found a gradual increase of 6, 7, 8, 9 and 10, "fathoms, where my soundings ceased, about half a mile from the point "where the river may be said to end."

An enlarged map from Bayfield's chart, made by Mr. Clarke, of the entrance to the river, was also examined. This chart showed Bayfield's

soundings, together with some taken by Mr. Clarke, but all indicating water of great depth. Apparently this matter has also lately engaged the attention of the Dominion Government—as shortly after leaving the mouth of French River I met a strong party of engineers on their way there, and under instructions from that Government, to thoroughly sound the entrance. The question will therefore, no doubt, soon be definitely settled.

As a *dernier ressort*, should our railway not be able to effect a junction with the lake navigation by means of a safe and easily accessible harbor at this place, a union between the two can be consummated at Byng Inlet previously referred to. In the event of this change becoming necessary, the location of the main line from South River at Lake Nipissing would remain the same as when pointing to the mouth of French River, with this exception, that on arriving within ten miles of the coast, a branch would be extended in a south westerly direction to Byng Inlet, a distance of ten miles—the main line turning to the right, would cross the French River and proceed to Sault Ste. Marie;—the branch connecting with, and accommodating the summer traffic of the lakes, while the main line will be placed in the most favorable position for conveying the through traffic, especially during the winter months, when the navigation is interrupted.

In connection with these remarks, it may be observed, that all lines of railway projected from the south or east, with the view of touching the waters of Lake Huron and the Georgian Bay, in order to obtain full efficiency, will have to aim at a connection with the Sault Ste. Marie to secure uninterrupted connection with western lines of traffic by means of a bridge to be erected at that place. Between Fort Erie, opposite Buffalo, on the south, and the Sault Ste. Marie on the north, with a coast line of over 950 miles intervening, there will be found no point where a bridge connection can be made with the United States, without causing a considerable injury to the navigation, if on a low level with swing bridges; or if on a high level, only attainable at a cost too great for any company to entertain. It may therefore be fairly assumed, that the Sault Ste Marie will become a governing point for all projected through lines striking the waters of the Georgian Bay, in their ultimate development; and, consequently, in the location of the respective routes, the one placed in such position as most easily to attain that end, other considerations being equal or nearly so, will more fully command the attention and confidence of capitalists, when solicited to take an interest in the enterprise. A projected line of two hundred miles or more in length, passing through a comparatively uninhabited and rough section of country, with little present local business, and touching, say, Parry Sound on the southern end of Georgian Bay, for the summer traffic only, can bear no comparison with a competing route commanding through traffic during the entire year. The relative comparison of distances and rates of several rival lines will be more fully examined further on, and in the meantime a brief description will be given of Byng Inlet, the nearest terminal-harbor to the mouth of French River, in the event of the latter place being found unsuitable for the purpose.

Following the coast line, this harbor is about twenty miles south of French River Terminus, and formed by a widening of the mouth of the River Megnatawan into a deep inlet through which it discharges into the the Georgian Bay. The length of this inner harbor is about seven miles; in places possessing a width of at least one thousand feet, and an average of five hundred. The depth of water ranges from sixteen to sixty feet, the shores are principally of rock; precipitous from the water, and from ten to twenty feet in height, with deep water generally to the verge of the cliffs. No difficulty will be experienced in placing warehouses, with connecting lines of sidings along both shores.

The inner harbor is protected by a small island at the entrance, which

effectually converts it into a smooth sheet of water during storms outside. The entrance or outer harbor is buoyed out on each side, for a long distance into the Lake, and a lighthouse, one hundred feet in height, erected on a small island, for guiding vessels during the night. I was informed that vessels had no difficulty in entering, as the prevailing winds were from the west and leading directly into the harbor. With winds from the N. W. and S. W. no difficulty was encountered there being sufficient space with depth of water for "beating." The anchorage is stated to be excellent clay bottom. A chart shewing harbor, lighthouse, buoys, soundings, sunken rocks and islands, is herewith submitted.

A small town is springing up at this place, deriving its existence from the presence of two extensive saw-mills, with a manufacturing capacity of from 20 to 22 millions of feet per annum, and employing upwards of three hundred men. This large quantity of lumber is shipped west and south during the season of navigation, and I was informed that schooners and steamers engaged in the carrying trade had no difficulty in approaching or leaving the harbor at any time during the season of navigation.

The general proposed course of the railway from this place is shown on the accompanying map, and will strike the main line ten miles from the mouth of French River.

Returning now to the latter locality, your attention is drawn to the map, showing the assumed direction of the main line from that place, to the point previously reached in the exploration from Lake Nipissing. This general course is adopted on the recommendation of an intelligent Algonquin Indian guide of Henvey's Inlet, and to the manor born, who rejoices in writing his name, Peter Shahwaknegwahnack.

For several miles back from the coast, and French River, the surface is extremely rocky, no continuous ledges to any extent, but of pinnacle or conical forms, with intervening ravines.

These valleys can be followed to a considerable extent, and with some rather sharp curvature and rock excavation, a very good line may be had. The country is also cut up with small lakes and streams, not shown on the map, but which may be avoided or crossed without much difficulty. The Indian's description was generally confirmed by explorers sent specially across this part of the country, and to a certain extent by myself. Altogether, I have no doubt there will be no serious obstacle encountered, but the entire district should be subjected to a thorough and minute instrumental examination before the question of exact location can be settled.

At the mouth of the River and along the sides of the harbor, there is ample space for warehouses facing the deep water dock on one side, with rail connection in the rear. The surface, however, is considerably broken up with rocky points, which will require blasting off to level the space for warehouses and tracks; the stones so removed could be used in the erection of the buildings. The considerable water-power existing at the site of the proposed lock may be employed for several factories, but the quantity of available space for building, in the immediate neighborhood, is limited.

In the event of the railway being built, and also, it is to be hoped, the canal, in the not far distant future, this place will become the site of an important city—even though it have to spread over an uneven surface.

With the foregoing remarks on the general characteristics of the country passed over, and points examined, the various distances will now be given which constitute the entire length of proposed railway—from Montreal to mouth of French River—and a comparison afterwards instituted with rival lines, both in regard to length, financial foundations, and traffic working qualifications between the same common points. In giving the

distances as scaled from the most approved maps, five per cent will in all cases be added, to cover additional length derived from curvature.

1st. Taking in the first instance, the Montreal Northern Colonization Railway:

	Miles.
Montreal to Aylmer	123 50
Aylmer to foot of Deep River	95 00
Foot of Deep River to Matawan	80.00
Matawan to South River, Nipissing	45 00
South River to mouth of French River	70.50
Total estimated approximate length	414.00

Of the above distance 115 miles will pass through Ontario, leaving a balance of 299 miles for the Quebec portion.

2nd. The proposed line from Montreal *via* Ottawa, Carleton Place, and Parry Sound, to mouth of French River:

	Miles.
Montreal to Hull	116.58
Hull to Parry Sound	225.25
Parry Sound to mouth of French River	64.50
Total distance	406.33

3rd. Proposed line from Montreal to mouth of French River, *via* Ottawa, Carleton Place, Pembroke and Lake Nipissing:

	Miles.
Montreal to Hull	116.50
Hull to Renfrew	72.00
Renfrew, *via* Pembroke, to Lake Nipissing	154.35
South River, L. N., to mouth of French River	70.50
Total distance	413.35

4th. Proposed line from Montreal to Mouth of French River *via* Ottawa, Carleton Place, Pembroke, Matawan, and Nipissing:—

	Miles.
Montreal to Hull	116.50
Hull to Renfrew	72.00
Renfrew to Matawan	122.75
Matawan to Mouth of French River	115.00
Total distance	426.25

5th. Montreal to Mouth of French River; *via* Grand Trunk Railway to Toronto, and thence *via* Northern Railway with extension to Parry Sound and French River:—

	Miles.
Montreal to Toronto	333
Toronto to Washago	100
Washago *via* Parry Sound to French River	130.75
Total distance	563.75

The following abstract will give the results in a more condensed form :—

		Miles.
1st.	Line *via* M. N. C. Railway	414
2nd.	" Carleton Place and Parry Sound	406¼
3rd.	" Do Pembroke and Nipissing	413⅛
4th.	" Do Do Matawan and Nipissing	426¼
5th.	Line *via* Grand Trunk and Northern Railways	563¾

An inspection of the above table will, at a glance, rule out 4 and 5, leaving 1, 2 and 3 for closer examination as regards comparative lengths. Of these latter, No. 2, or the Parry Sound line, apparently bears the palm, being seven miles shorter than its nearest rival, No 3, *via* Pembroke, and nearly eight miles less than No. 1, or the M. N. C. R. This advantage, however, is probably more apparent than real. No. 2, in striking directly across the Ontario Peninsula, has to overcome the high summit level, or crest of water shed, between the St. Lawrence and Lakes on one side, and the Ottawa, Lake Nipissing and French River on the other. While of the remaining two lines, one at least follows in the deep trough cut out by the Ottawa, and afterwards from Matawan to Lake Huron on a greatly reduced level.

What the height of this water crest above the Ottawa is, I do not know, but it must be many hundreds of feet, over which to elevate the traffic. Heavy grades on a line are equivalent to increased length for haulage of traffic. In other words of two rival lines between the same points, one possessing heavy grades but diminished length and cost of construction, the other having easy grades with increased length and cost, the latter one may prove the preferable one for adoption, when the future cost of haulage is considered.

At first glance, this Parry Sound route is attractive, cutting across the country from Carleton Place to Lake Huron and joining its waters by an iron band with tidal commerce at Montreal, in a reduced distance as compared with other routes as follows :—

	Miles.
1st Line *via* M. N. C. R. Matawan, Nipissing to French River	414
2nd Line *via* M. N. C. R., Carleton Place, Pembroke and Nipissing to French River	413¼
3rd Line *via* G. T. R. and Northern Railways to Collingwood	427
4th Line *via* Carleton Place to Parry Sound	341¾

In other words about 71½ miles shorter than any other of the rival lines.

Keeping in view, however, the governing principle of an uninterrupted rail connection during the entire year, with the great American Western lines, by means of a bridge at the Sault Ste. Marie,—failing in which all lines terminating on the Georgian Bay, will at least six months of the year, be without traffic, if the limited local quantity for years to come be excepted, and that for purposes of a correct comparison a common point, say mouth of French River, in the onward progress to Sault Ste. Marie be selected, an additional 64½ miles will have to be added to the Parry Sound route, to enable it to be placed on the same basis with Numbers 1 and 2 in the above table, thereby increasing its length to a little over 406 miles. No. 3 route terminating at Collingwood, will also labour under the same disadvantage during winter, and to reach the common point at French River, will increase its length as before stated, to 563¾ miles.

Assuming and admitting the fact that lines 1, 2 and 4 in the table, all pass through a comparatively uninhabited country, to a considerable extent, that little or no municipal assistance is possible for either, and that capitalists will not embark money in railways which terminating even at French River, must be comparatively idle half the year,—it becomes evident that the present construction of either line can only become possible by a large portion of the cost being borne directly by Governments; the balance required to complete the work to French River can then probably be obtained on bonds *guaranteed* by Government, until the through connection is effected with American roads at Sault Ste. Marie, when the legitimate traffic will be sufficient to meet the bond interest.

Rumor states that the policy of the Dominion Government is to assume the entire cost of the road from mouth of French River, to the east end of Lake Nipissing, probably to South River, a distance of 70¼ miles; and subsidize a company from there easterly in the general direction of Ottawa. With this first section built, the relative distances to construct of the three lines under consideration, will for purposes of a rough comparison be as follows:—

1st.	M. N. C. R., Aylmer *via* Matawan to Nipissing....	220 miles.
2nd.	Canada Central from Renfrew *via* Pembroke direct to South River.....	154 "
3rd.	Carleton Place to Parry Sound.....	194¼ "
4th.	Do do French River.....	258¾ "

To arrive at a more definite conclusion as to the relative financial merits of these lines, we will consider the probable total cost of each, the amount of assistance reasonably to be expected from Governments and Municipalities; with the balance in each case to be provided by sale of bonds. A uniform rate of $30,000 per mile will be adopted as the basis of construction including necessary equipment.

In the case of either of the two first, a similar amount of assistance from the Dominion Government may be anticipated. Rumor places it at $4,000 per mile, and taking the nearest distance to rail connection, Nipissing *via* Pembroke to Renfrew, 154 miles, at $4,000 per mile, will give $616,000.

This amount of mileage on the M. N. C. R., starting from South River at Lake Nipissing, will bring us to a point opposite the head of Calumet Island—about sixty-six miles above Aylmer.

With this sum supposed to be available to either of the Ottawa Valley lines, the additional assistance to be derived from the Local Governments of Ontario and Quebec will next be considered.

As is well known, the Province of Quebec made a land grant at the rate of 10.000 acres per mile from Quebec to foot of Deep River, a distance of about 379 miles—and has determined to continue that policy to the Matawan, if a line can be built on the north shore of the River. This will give any company empowered to build the road from Aylmer to the Matawan 1,750,000 acres. The value of this land, rich in pine timber and minerals, has been variously estimated by experts, at from $1 to $5 per acre. Taking a moderate view, we will on the safe side, in placing it at $2; a price recently obtained for timber limits alone, and there will result, $3,500 000. To this add $150.000 already granted by the county of Pontiac, $100,000 which Ottawa City should contribute, and at least $500.000 from the City of Montreal. Collecting these several items, we find the Montreal Northern Co-

lonization Railway presenting something like the following exhibit—Aylmer to Nipissing:—

Total cost, 220 miles at $30,000		$6,600,000
Deduct.		
Dominion Grant	$ 616,000	
Land grant, Province of Quebec	3,500,000	
Grant, county of Pontiac	150,000	
Do, city of Ottawa	100,000	
" " " Montreal	500,000	$4,866,000
Balance to be raised on Bonds		$1,734,000

Treating the extension of the Canada Central from Renfrew to Nipissing in a similar manner, we have as before, from the Dominion Government, $616,000.

In the assistance rendered local railways, Ontario has not in some respects been so liberal as the sister Province. She had already, main arterial lines, in the Grand Trunk and Great Western Railways, passing through the most populous, wealthy and influential sections along the front of the Province. Branch roads running north into the back country, have been built, or are in process of construction, at many points, such as Coteau, Prescott, Brockville, Gananoque, Kingston, Belleville, Trenton, Cobourg, Port Hope, Toronto, Hamilton, &c., with the view of opening it up, and drawing trade down to the front, at those several places, especially from the Ottawa and Nipissing regions. Many macadamized and ordinary roads are also built for the same purpose. The project of a railway along the line of their northern frontier, and being called on to contribute largely in aid of its construction for the purpose, as they might well suppose, of attracting and diverting from the front, the trade of the Ottawa Valley, by this rear line, to Montreal, would scarcely make it a popular scheme to the great bulk of inhabitants of Ontario, living in the front of the Province, whose voices would determine the amount of assistance, if any, to be granted. Up to the present, Ontario has contributed but from $2,000 to $4,000 per mile in aid of lines running through poor sections of the country, and more frequently the first than the last figure. It is possible that in view of the many calls for assistance to be made by roads heading from the front, to aid in their completion; from the projected "Ontario and Quebec" line to pass from Toronto to Ottawa, and open up an important central section; and possibly from the "Parry Sound and Carleton Place" line, also to run through the interior of the Province, that the Ontario Legislature, however otherwise favorably inclined to the extension of the Canada Central, *via* Pembroke to Lake Nipissing, might decide, that any advantages to accrue from such location, would be almost equally available to its Province, if the line were placed on the Quebec side of the Ottawa River, where it would be so readily accessible from the northern frontier of Ontario, and at the same time be built without cost to the latter.

My strong impression is, that on consideration, such will be the decision of the great majority of the inhabitants of Ontario, and consequently no Provincial aid will be given the Canada Central extension *vi a* Pembroke to Nipissing—but to be on the safe side, it will be assumed for the present that the *maximum* grant of $4,000 per mile is extended, and that Montreal, Ottawa, and County of Renfrew also assist,—the financial condition of the line will, under these circumstances, stand as follows for the 154 miles to be built:—

ESTIMATED COST OF CONSTRUCTION.

154 miles, at $30,000 per mile		$4,620,000
Deduct—		
Dominion Grant, as before, $4,000 per mile	$616,000	
Ontario Grant, " $4,000 "	616,000	
County of Renfrew, assumed same as Pontiac	150,000	
City of Ottawa, same as before	100,000	
City of Montreal, same as before	500,000	
		1,982,000
Balance to be provided by issue of Bonds		$2,638,000

Applying the same principle to the Carleton Place and Parry Sound route, with the exception of Dominion grant, which in this case would not be made, we have:

Total length to mouth of French River 258¾ miles, at $30,000 per mile		$7,762,500
Deduct—Assumed grant from Ontario 258¾ miles, at $4,000 per mile	$1,035,000	
Assumed Municipal grants	150,000	
City of Ottawa	100,000	
City of Montreal	500,000	
		$1,785,000
Balance to be provided by issue of bonds		$5,977,500

The measure, to capitalists, of the financial strength of the several lines, is indicated by the diminished amount of bond issue, and will be seen at a glance in the following abstract:—

1st. Montreal Northern Colonization Railway, Aylmer to Nipissing	$1,734,000
2nd. Canada Central Extension, Renfrew *via* Pembroke to Nipissing	2,638,000
3rd. Carleton Place and Parry Sound route, to French River	5,977,500

In other words, it appears that the Montreal Northern Colonization Railway, with sixty-six miles more to construct than its Pembroke rival, will have $904,000 less to provide by issue of bonds; and $4,243,500 less than the more southern route *via* Parry Sound.

These results are rather startling, but the more closely they are examined, the more evident their truth will appear. The construction of this Ottawa Valley line, while to the Province of Ontario generally, a matter of but small moment, is to Quebec one of the most vital importance, and well worth the expenditure she is willing to make, if it can be secured through her domain. The Grand Trunk Railway, costly as it proved, has been the principal instrument in the production of Ontario's prosperity, its rapid growth in population and wealth, and has indirectly paid its cost many times over. This great Northern Trunk line, from the city of Quebec to the Matawan, will produce corresponding results, and the Province of Quebec is willing to strain every nerve to secure its construction. It may be objected, in the financial comparison, that too great value has been placed on the land grant, and consequently the scales turned in favor of the Quebec line; this is, of course, a matter of opinion, and is left to be discussed by those who have given the subject consideration. My own impression, the result of some knowledge and a good deal of reflection, is that the sum assumed, $2 per acre, will be obtained, if properly handled, from timber alone. With the railway in operation, and passing to a considerable extent in the neighborhood of the limits, a greatly enhanced

value will be given every tree accessible through the many tributaries of the Ottawa which drain this great region. At the present time, there is a sufficient quantity of timber annually destroyed, or going to decay, within the limits—which would be under rail influence, to meet the interest on the bonds were there such an opportunity of conveying it to market as will be presented by the operation of the railway. Latterly the lumber traffic of the Ottawa Valley has to a large extent changed its character, less square timber being taken out, and much greater quantities of sawed lumber manufactured, principally for the American markets. The saw logs are obtained chiefly on the upper waters of the Ottawa, and from the numerous tributaries which flow into it, on the north and south. These logs are floated down, passing the principal rapids by means of artificial slides constructed by the Dominion Government, to Ottawa City, the present head of navigation. Here they are cut into all descriptions of lumber, and from this place, shipped principally by water, to Montreal, Quebec, Burlington and Troy, as distributing points. The time and expense of the floatage referred to, is such that but the best logs are taken, leaving a large percentage of valuable timber in the forest to decay, which otherwise could be utilized. With the railway located through the Ottawa valley, and touching its waters at almost every point, numerous steam saw mills could be erected at suitable localities, on bays or wide stretches of the river, where large numbers of logs could be assembled and boomed in. The manufacture of the lumber could thus be *localized* at many convenient places, having easy "siding" connection with the railway. The present refuse of pine trees left in the forest could then be manufactured to advantage, and all other descriptions of lumber as well. Cars loaded at those mills could be "billed" through to any city, town or locality in Canada, or in the United States, and a considerable saving be effected in transport, in the diminished handling of the lumber over that now taking place. Each manufacturing point would become the nucleus of a town or city, in time giving to and taking considerable ordinary traffic from the railway. At many places along the line of the Ottawa, vast water power exists, and no doubt in the future will be employed in manufacturing operations, also assisting to build up busy and important cities. All this will be hastened and facilitated by the generative actions of the railway and future canal, which in so far as possible, should be placed side by side, one the hand-maiden or compliment of the other.

Be this as it may, neither line can be built in the meantime without additional assistance, at least for several years to come, from the Dominion Government, over the sum stated.

Admitting the Dominion Policy to have been correctly assumed, in the construction of a line from the mouth of French River to Lake Nipissing, *what then?* It will simply be, so far as traffic is concerned, *a railway commencing nowhere, and ending in a similar place,*—being practically inaccessible at either end for six months of the year. The mere bagatelle of $4 000 per mile for its eastern extension, while the western end remains at the mouth of French River, with through traffic but for the season of navigation, is a platform no capitalists will accept, even with the *minimum* amount of bonds, $1,734,000, required for the Northern Colonization rail connection on the east. This first section of 70½ miles, by the Dominion Government, must and no doubt is, but the first instalment of the entire line from Nipissing to Sault Ste. Marie, when the success of the entire railway is assured. Until this second instalment is obtained, however, and to render the first a success, the bonds required for the eastern extension will require to be guaranteed by Government, or I am afraid there will be little chance of this Dominion line in the forest being reached for years to come in any direction, from the outside world.

Assuming the construction, by the Dominion Government, of the section from Georgian Bay to Lake Nipissing to be fully determined as the first increment in the general railway policy to Sault Ste. Marie, and if so, it is a wise decision, it will then be equally politic before becoming committed to one line or the other, eastward from Nipissing, to appoint an engineer in whom the three governments have confidence, to make thorough surveys from Nipissing to Renfrew in one direction, and *vi*z Matawan and the North Shore of the Ottawa, to Aylmer, in the other.—Let both lines be carefully estimated and compared with reference to cost, grades, curvature and relative distances, say to Ottawa City,—let the several local Governments and Municipalities interested, indicate the amount of assistance to be granted each line respectively—the Dominion Government adding to both an amount per mile corresponding with the line having the least mileage to construct. With all this information accurately gathered and digested, let a balance be struck, and the engineering, traffic and financial advantages of one or the other clearly established.

The Dominion Government will then be in a position to judge understandingly, and to act in the best interests of the entire people.

From all the information I could collect, an excellent route can be had, either from Renfrew or from Pembroke to Nipissing, and possibly cheaper in construction than the figure indicated in the comparison, but probably a considerably higher summit level will have to be surmounted than *via* the Quebec line. The Ontario Government may be incited by the example of the sister Province, and rival her bounty in aid of the enterprise; or she, in place of even granting $4,000 per mile, may give nothing. Assuming the relative correctness of the previous calculations for purposes of comparison, the Dominion Government would be called to pay, on seven per cent bonds, if the line pass through Ontario *via* Pembroke, an annual interest of $184,660. If passing through Quebec *via* Matawan, $121,380, or a saving in following the latter line of $63,280. If Ontario contribute nothing in aid of the "Canada Central," the yearly difference of interest in favor of the "Northern Colonization" will be increased to $106,400.

In any event, a connection with the Dominion line from Georgian Bay to Nipissing, must be had from the east, and to which, for a number of years, that Government must expect to contribute largely. Terminating at the Georgian Bay, the traffic receipts from that end easterly to Ottawa, will not pay ordinary running expenses the year round, to say nothing of the Bond interest, even when assisted so liberally by the Province of Quebec.

For the Dominion Government to build 70½ miles of expensive railway, far in the depths of the forest, on the supposition that it can afterwards be made available with rail connection easterly, by the comparatively trifling expenditure of $4,000 per mile, for at least 154 miles, also through a forest, and traffic for but six months of the year, will be to commit a great error; one into which the sagacious and able statesmen who now direct the destinies of Canada, are not likely to fall.

The selection and location of this eastern connecting link will, therefore no doubt, be decided on its true merits, and after a careful consideration of the entire subject. In the event of more thorough and instrumental investigations establishing a greater equality in the characteristics of the two lines, the Province of Quebec would still have a moral claim of considerable weight. That section of the Province, north of the St. Lawrence and Ottawa, with a population exceeding half a million souls, cheerfully contributed its *quota* in aid of the construction of the Grand Trunk and Intercolonial Railways, St. Lawrence and Welland Canals, with other public works, by which Ontario, the country south of the St. Lawrence, and the

Maritime Provinces have so largely benefitted, and from which the section referred to has received comparatively little return. Now that the Province of Quebec is making such gigantic efforts and sacrifices to construct her great Provincial highway in the North, may she not expect and receive some consideration, from those portions of the Dominion, to whose prosperity she has in times past so largely contributed.

Before taking leave of the subject, it may be well to refer briefly to the lines under consideration, in their relation to through traffic; selecting as objective points in the west, Chicago and Duluth—with Montreal as the head of tide-water, in the east.

Taking in the first instance Chicago, and referring to several of the most conspicuous routes, partly by water and rail, for traffic during the season of navigation, we find the following:—

1st.	Chicago to Collingwood.....Water	575	Miles.
	Collingwood *via* Toronto to Montreal.....Rail	427	"
	Total distance.....	1002	Miles.
2nd.	Chicago to Parry Sound.....Water	550	Miles.
	Parry Sound *via* Ottawa to Montreal.....Rail	341¾	"
	Total distance.....	891¾	Miles.
3rd.	Chicago to Mouth of French River.....Water	530	Miles.
	French River *via* Matawan & Ottawa.....Rail	414	"
	Total distance.....	944	Miles.
4th.	Chicago to Montreal *via* Detroit, Sarnia and G. T. Railway.....Rail	848	Miles.
5th.	Chicago to Montreal, by navigation *via* the Great Lakes and River St. Lawrence.....	1348	Miles.

Placing these several distances in juxtaposition we have,

No. 1.	Route *via* Collingwood and Toronto.....	1002	Miles.
" 2.	" " Parry Sound and Ottawa.....	891¾	"
" 3.	" " French River and Matawan.....	944	"
" 4.	" " Detroit, Sarnia and G. T. R.....	848	"
" 5.	" " Great Lakes and St. Lawrence.....	1348	"

To render the comparison still more comprehensive, we will endeavor to ascertain the approximate cost of transporting a ton of freight over the respective routes. For this purpose the rates given by high authorities will be used for the different modes of transportation.

For Lake Navigation with long voyages, 2 mills; and for short voyages, 3 to 4 mills, per ton per mile may be assumed. We will use an average and select three mills for the 550 mile trip.

Railway transport has been variously estimated under different conditions of grades, lines and length of haulage, at from 6 to 25 mills per ton per mile. To be on the safe side, the figure will be placed at 20 mills or 2 cents.

The several routes from Chicago to Montreal will then compare as follows:—

1ST.—COLLINGWOOD, TORONTO AND G. T. R.

Lake navigation—	575 miles at	3 mills		1.72½
Rail	—427 "	20 "		8.54
Net cost of movement per ton				$10.26½

2ND.—PARRY SOUND AND OTTAWA.

Lake navigation—	550 miles at	3 mills		1.65
Rail	—341¾ "	20 "		6.83½
Net cost of movement per ton				$8.48½

3RD.—FRENCH RIVER AND MATAWAN.

Lake navigation—	530 miles at	3 mills		1.59
Rail	—414 "	20 "		8.28
Net cost of movement per ton				$9.87

4TH.—DETROIT, SARNIA, TORONTO AND G. T. R.

Rail—848 miles at 20 mills	$16.96
Water	0.00
Net cost of movement per ton	$16.96

5TH.—LAKES AND RIVER ST. LAWRENCE NAVIGATION.

Lake navigation—	1145 miles at	2 mills		$2.29
River "	132 "	3 "		0.40
Canal "	71 "	8 "		0.57
Net cost of movement per ton				$3 26

In the above comparision—leaving out No. 5—No. 2 or the Parry Sound route heads the list in diminished cost, to the extent of $1.38¼ per ton due to shortness of the rail portion. The possibly heavier grades anticipated on this line may come in as a disturbing element, and more nearly equalize the amount with that of No. 3—No. 2 having, however, been practically ruled out from the *possible* by financial considerations of first cost, it is satisfactory to find its next competitor, No. 3, in which your company is more immediately interested, comparing so favorably with existing lines, being 39½ cents per ton cheaper than its Collingwood rival, and $7.09 less than the Grand Trunk through rail route. The Canada Central extension via Pembroke and Nipissing will also present the same favorable result.

The comparison is still more striking if Duluth at the western end of Lake Superior is selected. This city is the present eastern terminus of the Northern Pacific Railway, now in course of construction through the United States.

An extension of your line from the mouth of French River to the Sault Ste. Marie, a distance of 185 miles, will form a junction with a prolongation of the Pacific road easterly from Duluth, of 380 miles; making a total length of 565 miles to be constructed in Canada and the United States.

The distances between Montreal and Duluth, by several routes, may be compared as follows:

1st. Line *via* Ottawa, French River, and Sault Ste. Marie—Rail ..... 979 miles.
2nd. Grand Trunk Railway, *via* Chicago, Milwaukee, La Crosse and St. Paul—Rail ..... 1,383 miles.
3rd. Water route, *via* St. Lawrence and Great Lakes ..... 1,380 miles.

The above table shows the distance *via* M. N. C. R. to be 404 miles less than by any existing rail route.

Assuming the City of New York to be the point sought from Duluth, an approximate comparison will give:—

Line *via* Sault Ste. Marie, French River and Montreal, to be about ..... 1,386 miles.
Line *via* Chicago, Michigan Southern and New York and Erie, to be about ..... 1,400 miles.

The difference will be much more marked, if Boston be the Ocean port sought by Duluth.

Line *via* Sault Ste. Marie, French River and Montreal, about ..... 1,269 miles
Line *via* Chicago, Great Western, New York Central, &c ..... 1,470 "

Shewing a saving in distance of 201 miles.

Portland may also be mentioned as a still more favorable sea-port, if the Canadian line were built; but enough has been written to demonstrate its importance, not only in opening up our inland territory, and also in forming eventually an important connecting link of the railway systems of Canada and the New England States with that vast and fertile region which must in the very course of events be tributary to Duluth, Milwaukee, and Chicago; with numerous other cities yet to exist on the shores of Lakes Superior and Michigan.

I have now given much of the information acquired during my recent hurried exploration of this interesting portion of Canada, with the deductions which may fairly be drawn therefrom. The measurements in all cases have been taken from maps, which instrumental surveys may perhaps modify in some degree, but the general results will no doubt be substantially the same.

In conclusion, I beg to name several gentlemen to whom I am much indebted for assistance rendered. Mr. Poupore, M.P.P., of Pontiac, kindly arranged preliminaries, and accompanied the expedition to Lake Nipissing, when to his regret, private business forced his return. Mr. Alexander Moffatt, of Pembroke, who had previously passed up the Matawan, over Lake Nipissing, and down French River, thereby having acquired some knowledge of the country, obligingly volunteered his services, and remained with me thoughout the entire trip, obtaining guides and information which otherwise would have been difficult to get. Mr. Dill, the manager of extensive lumber establishments on the Georgian Bay, extended kind hospitalities to the members of the expedition, and also spent some time with us in exploring the coast. All these gentlemen refused any compensation for their valuable services, and I trust the thanks of the Board will be suitably conveyed to them.

I have the honor to be,

Sir,

Your obedient servant,

CHARLES LEGGE,
Chief Engineer,
M. N. C. R.